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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/147,914 05/25/99 EYAL

A U-012130-1

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HM12/1205

EXAMINER

OH, T

ART UNIT

PAPER NUMBER

1623

5

DATE MAILED:

12/05/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/147,914

Applicant(s)

Eyal et al

Examiner

TAYLOR VICTOR OH

Group Art Unit

1623



☒ Responsive to communication(s) filed on Jun 2, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-34 is/are pending in the application

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-34 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Art Unit: 1623

***Claim Rejections - 35 USC § 112***

1. Claims 1 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 34, the phrase "methods known per se" is written. This expression is vague as to what kinds of methods are available for the reaction process. An appropriate correction is recommended.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1623

4. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glasser et al (EP 0393818) in view of Walkup et al (U.S. 5,252,473).

Glasser et al discloses a process for the production and purification of lactic acid by means of fermentation, electrodialysis, and ion change (see page 2 , lines 1-2) in the following steps:

- a. converting the most of carbohydrate to lactic acid salt,
- b. subjecting the lactic acid salt containing aqueous stream to water-splitting electrodialysis using anion-permeable and cation-permeable membranes (see page 4 , lines 5-6 ),
- c. treating the resulting lactic acid product first with an acidic ion exchanger in the acid form to remove any cations and subsequently with a weakly basic ion exchanger in the free base form to remove any anions to obtain the a purified lactic acid product (see page 3 , lines 39-44 ),

Furthermore, in the fermentation process, the pH of the medium is maintained from 4.8 to 5.7 so as to form a good lactate salt and the pH level is achieved by the addition of alkaline carbonates, alkaline earth hydroxides (see page 3 , lines 7-9 ) .

However, the instant invention differs from Glasser et al in the followings: a cation and anion exchanger are liquid exchangers, the hydrolysis is conducted at a temperature higher than 80° C. in a CO<sub>2</sub> containing atmosphere, the second product is used as a neutralizing agent in fermentation, and the recovery of the lactic acid is made by the use of the distillation.

Walkup et al discloses a process of producing lactic acid and esters of lactic acid in the following reactions. In the first reaction, ammonium lactate produced by a fermentation process of carbohydrate materials (see col. 3 , lines 37-40) can be decomposed into NH<sub>3</sub>, which can be used for controlling pH in the fermentation (see col. 2, lines 6-8) and lactic acid (see col. 6 , line

Art Unit: 1623

5) ; furthermore, purified lactic acid can be produced from the CO<sub>2</sub> catalysis of ammonium lactate and alcohol solution in the presence of an acid ion exchange resin at a temperature in the range of 100° to 150° C. (see col.14 , lines 26-40). In addition, a simple distillation is recommended to purify the desired product (see col.14 , lines 53-57).

Concerning the use of the liquid cation and anion exchangers, the references are silent. However, there is little difference between the use of the solid and liquid ion exchangers and they are well-known in the art. Therefore, it would have been obvious for the skillful artisan to have used the liquid ion exchangers as an alternative to the solid ion exchangers with an expectation of a similar success.

Therefore, if person having an ordinary skill in the art had wished to develop the purification process of lactic acid involved in the hydrolysis in the presence of the CO<sub>2</sub> containing atmosphere by the use of the distillation, it would have been obvious for the skillful artisan to have used Walkup et al's hydrolysis and distillation in the Glasser et al 's process in order to increase the efficiency of the overall process.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Eyal et al (U.S. 5,766,439) discloses a process for producing an organic acid in the following steps : producing an organic acid by fermentation, adding an alkaline earth base to the fermentation, reacting the alkaline earth salt of the organic acid with a source of ammonium ions,

Art Unit: 1623

reducing the concentrations of divalent cations, and converting the ammonium of the organic acid to free organic acid.

Sterzel et al (U.S. 5,453,365) discloses a preparation of lactates by fermentation of the mixture of sugars, conversion of the lactic acid followed by esterification during the process, in which the lactic acid is neutralized with an alkaline earth metal carbonate, added with ammonia and carbon dioxide, and the purified ammonium lactate solution is esterified with an alcohol.

Urbas (U.S. 4,444,881) discloses a process for the recovery of organic acids from dilute aqueous solutions in the following steps: adding a water-soluble tertiary amine carbonate to the calcium salt solution to form the trialkylammonium salt of the acid, and heating the concentrated trialkylammonium salt solution to obtain the acid and the amine.

Cockrem et al (U.S. 5,210,296) discloses a process for producing a high pure lactate ester or lactic acid from a concentrated fermentation broth by acidification in the presence of an alcohol with sequential esterification, distillation of high purity ester.


Kumagai et al (EP 0614983A2) discloses a method of producing lactic acid and lactic esters in the following steps : carrying out the adjustment of the pH of a culture medium containing lactic acid with ammonia, adding an alcohol, a mineral to the solution so as to undergo the esterification process.


Baniel et al (U.S. 5,510,526) discloses a process for the recovery of lactic acid from a lactate solution from a fermentation broth in the presence of a basic substance such as ammonium hydroxides by way of extraction or ammonium salt formation.

Art Unit: 1623

Any inquiry concerning this communication or earlier communications from the examiner should be directed to T. Victor Oh whose telephone number is (703) 305-0809. The examiner can normally be reached on Monday through Friday from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Geist, can be reached on (703) 308-1701. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4556.

  
10/20/2003

  
GARY GEIST  
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